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Field Operations Manual for Assessing the Hydrologic Permanence and Ecological Condition of Headwater Streams

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Field Operations Manual for Assessing the Hydrologic Permanence and Ecological Condition of Headwater Streams

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PREFACE

The mission of the Ecological Exposure Research Division (EERD), National Exposure Research Laboratory (NERL), United States Environmental Protection Agency (USEPA) is to improve the scientific basis for understanding, measuring, and protecting biological integrity so that USEPA and other resource agencies can make sound, defensible environmental decisions. Our research is primarily focused on the development, evaluation, and implementation of new methods to assess ecosystem condition, to evaluate biotic responses to environmental stressors, and to predict future vulnerability of natural populations, communities and ecosystems.

This document originated from a research project, the Headwater Intermittent Streams Study (HISS), funded through the USEPA's Regional Methods (RM) Program (overseen by the Biological Advisory Committee and supported by the USEPA, Office of Science and Policy). The purpose of RM is to support development of methods needed by EPA regions, states and tribes to meet their monitoring and enforcement objectives. The widespread need for standardized methods for assessing headwater streams is apparent from the sponsorship and participation by USEPA Regional offices (1, 2, 3, 4, 5, 8, 9 and 10) and several state offices therein. The initial development of the methods was in forested headwater streams located in Indiana, Kentucky, and Ohio over 2003 and 2004. Following training workshops, state and regional teams used the methods to collect data from forested headwater streams in Illinois, New Hampshire, New York, Vermont, West Virginia, and Washington. This manual is a product of the working collaboration among EERD, regional, and state scientists. We hope that the methods described in this manual will be useful to individuals and organizations interested in monitoring and protecting headwater streams.

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ACRONYMS AND ABBREVIATIONS

^{o}C	Degrees Centigrade
µm	Micrometer
µS/cm	Micro-Siemens per Centimeter
ACI	Algal Cover Index
AFDM	Ash-Free Dry Mass
BACI	Before/After and Control/Impact
BF	Bankfull
cm	Centimeter
cm^2	Square Centimeters
Cond	Conductivity
DEM	Digital Elevation Model
DI	Downstream Intermittent Site
DO	Dissolved Oxygen
DQO	Data Quality Objectives
E	Ephemeral Site
EERD	Ecosystem Exposure Research Division
EMAP	Environmental Monitoring and Assessment Program
FCSPD	Fairfax County Stormwater Planning Division
FPA	Flood Prone Area
GPS	Global Positioning System
HISS	Headwater Intermittent Streams Study
IEI	Intermountain Environmental, Inc
in	Inch
km	Kilometer
km2	Square Kilometers
LIDAR	Light Detection and Ranging
m	Meter
m^2	Square Meters
m^3s^{-1}	Cubic Meters per Second
m/s	Meters per Second
mi	Miles
mi^2	Square Miles
mg/l	Milligrams per Liter
ml	Milliliter
mm	Millimeter
NaCl	Sodium Chloride
NAWQA	National Water Quality Assessment
NCDNR	North Carolina Department of Natural Resources
NCDWQ	North Carolina Division of Water Quality
NHEERL	National Health and Environmental Effects Laboratory
NRCS	National Resources Conservation Service

NRMRL	National Risk Management Research Laboratory
NYSDEC	New York State Department of Environmental Conservation
Ohio EPA	Ohio Environmental Protection Agency
OW	Office of Water
OWOW	Office of Wetlands, Oceans and Watersheds
P	Perennial Site
PC	Personal Computer
PDA	Personal Digital Assistant
PVC	Polyvinyl chloride
RHAF	Rapid Habitat Assessment Form
RM	Regional Methods
SE	Standard Error
SVL	Snout-Vent Length
Temp	Temperature
TNC	The Nature Conservancy
UI	Upstream Intermittent Site
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VTDEC	Vermont Department of Environmental Conservation